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AUTHOR Marttunen, Miika; Laurinen, Leena
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ABSTRACT

This article describes a teaching experiment in Finland to develop critical thinking and argumentation skills in a university course using both face-to-face and e-mail settings. Subjects (n=49) were advanced students of education and three faculty members. All students received two lectures on argumentation and packages of argumentative writings from periodicals, newspapers, and other sources on such controversial topics as sex roles and equality in education, discipline problems, the compulsory teaching of Swedish, and physical punishment in child rearing. All students were taught four different methods of argumentation free debate, problem-solving discussion, role play, and panel discussion. For 10 weeks half the students engaged in face-to-face seminar discussions; the remaining students participated by exchanging e-mail messages. E-mail students were required to write at least three messages a week that demonstrated their own well-grounded arguments and included critical comments of other students' positions. Preliminary results comparing the four different methods found that face-to-face discussions evoked the most counterargumentation. Comparison of face-to-face with e-mail environments found that e-mail discussions were more structured and included more argumentative opinions and counterargumentation. Teachers found it easier to give feedback in the e-mail environment. However, unlike face-to-face discussion, e-mail does not develop oral argumentation skills. Results suggest the value of a combined approach. (Contains 11 references.) (DB)

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LEARNING OF ARGUMENTATION IN FACE-TO-FACE AND E-MAIL ENVIRONMENTS

Miika Marttunen and Leena Laurinen
University of Jyväskylä
Department of Education
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Paper presented at the Fourth International Conference on Argumentation (ISSA), June 16 - 19, 1998, University of Amsterdam, The Netherlands

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Introduction

Recent studies (e.g. Littlefield 1995; Marttunen 1997) have shown that learning environments based on interaction and debates between students are beneficial when the aim is to promote students' argumentation and critical thinking skills. However, learning environments that support this objective are quite rare in Finnish higher education. Previous studies (Steffensen 1996) concerning higher education in Finland have indicated that the typical Finnish student lacks both a critical attitude towards knowledge and a willingness to engage in critical discussions on the study contents. Similar results are also reported by Mauranen (1993) and Hirsjärvi, Böök, and Penttinen (1996), who found that the students in a Finnish university seminar hesitated to criticize each others' opinions or that of the teacher, who was experienced as an authority whose views should not be called in question. Finnish students' argumentation skills have similarly proved poor (Marttunen 1997), and for this reason, especially when they were approaching the end of their studies, students have sometimes found it difficult to participate in seminar debates (Laurinen 1996). Hence, more such learning environments and study methods that activate the students in mutual dialogue and argumentative discussions of the study contents is needed in Finnish higher education.

The development of new information technology, such as electronic mail (e-mail), has facilitated communication between people. Recent studies (e.g., Ruberg, Moore & Taylor 1996) have also indicated that e-mail is effective in establishing interaction between students. E-mail as a communication medium includes many features that facilitate person-to-person communication. First, e-mail discussions are asynchronous (time and place independent) in nature, which makes it possible for one to write and read e-mail messages at any time convenient to him/her. Thus, e-mail working can also be easily integrated with working that presupposes simultaneous presence at certain time and place. Second, e-mail has been characterized as a "democratic" medium that allows various kinds of people regardless, for example, of their race, looks, occupational status, and level of education, to participate in interaction on an equal basis. When communication is textual and the participants do not see each other it is not so difficult to put over one's own points of view as it may be in face-to-face situations. Third, the informal nature of e-mail language also makes it easier for one to put forward opinions and arguments: a typical feature of e-mail culture is that the texts do not have to be carefully revised, but it is enough that the writer's thoughts are delivered to other people. However, when e-mail is used one has to formulate his/her thoughts into written text, which makes the message more considered than in the case of spoken language.

This article describes a teaching experiment in which academic argumentation was

practised in a university course. The course was carried out at the Department of Education in the University of Jyväskylä, Finland, during the spring term 1998. The learning of argumentation by e-mail has previously been studied (Marttunen 1997) at the same department. The results of this earlier project indicated that the level of argumentation in students' e-mail messages improved as the e-mail discussions proceeded. Thus, the study suggested that e-mail can be regarded as an appropriate medium for developing the skills of argumentation. The main deficiencies of the previous study were, first, the lack of a comparison group in which argumentation skills would also have been practised in a face-to-face situation. Second, the actual teaching intervention in the e-mail study experiment was quite slight: the students were not taught argumentation in the strict sense, but merely carried out argumentative group discussions with the help of e-mail.

The current study builds on the results and experiences of the previous project. First, argumentation was practised in both face-to-face and e-mail environments. This makes it possible to compare the nature of textual e-mail and oral face-to-face argumentation. Second, the teaching of argumentation was especially emphasized in the course: two lectures on argumentation were included in the course, four different working methods (free debate, problem-solving discussion, role play, and panel discussion) were used in organizing students' argumentative seminar discussions, and students performed preliminary exercises with authentic texts before the seminars. The results reported in this article concentrate on the description and comparison of the appropriateness of the different working methods in teaching and studying argumentation in face-to-face and e-mail environments.

Method

Subjects

The subjects (n = 49) of the study, 40 women and 9 men, were students of education who were in the later stages of their academic studies. The majority (42/49) of them were actual students of the university, while 7 students studied in the Open University. Three teachers, who all belonged to the faculty of the university, also participated in the study.

Learning material

Studying in the course was based on the learning material that consisted of argumentative writings taken from newspapers and periodicals, as well as scientific texts. The material was divided into 7 text packages based on four educational themes: 1) Sex roles and equality in education (2 packages); 2) Discipline problems in school work: causes and proposed solutions (1 package); 3) The compulsory teaching of Swedish in school (2 packages), and 4) Physical punishment as a child-rearing method (2 packages). The main reason why these educational themes were chosen was that it was supposed that they would readily arouse conflicting opinions among the students, and thus, effectively bring about argumentative discussions. Each text package also included exercises in argumentation, the purpose of which was to practise the students' skills in analysing argumentative texts, and in this way also prepare them beforehand for the seminar work.

Design of the study

The study was quasi-experimental in nature (Campbell & Stanley 1963). The subjects were divided into four experimental groups (n = 27), and to a control group (n = 22). The

experimental groups were named face-to-face group A, face-to-face group B, e-mail group A, and e-mail group B. The groups were matched so that both men and women as well as young and older students were represented in each of the groups. The students of the experimental groups studied argumentation during a ten week course, while the students of the control group did not engage in argumentation studies. Before the course all the subjects took part in a pretest, and after the course, in a posttest. The tests measured the level of the students' argumentation skills. The design of the study is shown in Table 1.

Table 1. The design of the study

Experimental groups (n = 27)				
Matching	Face-to-face A (n = 7)	Pretest	Argumentation studies	Posttest
Matching	Face-to-face B (n = 9)	Pretest	Argumentation studies	Posttest
Matching	E-mail A (n = 5)	Pretest	Argumentation studies	Posttest
Matching	E-mail B (n = 6)	Pretest	Argumentation studies	Posttest
Control group (n = 22)				
Matching		Pretest	----------	Posttest

Learning environments

During the ten weeks of study, the students of the experimental groups practised argumentation by engaging in argumentative discussions on the basis of the course material. The central aim of the discussions was to develop the students' academic discussion and argumentation skills.

The discussions in the *face-to-face groups* were real-time and oral in nature. Eight seminar sessions once a week were organized. Two of the weeks were reserved for lecture teaching. Each seminar session was based on different text material and exercises relating to it. The students read the texts and did the exercises before each seminar session. Each of the two face-to-face groups had its own teacher. The lecturer was the same teacher who taught one of the face-to-face groups. The task of the teacher was to direct the discussions so that the students would present well-grounded arguments on the subjects encountered in the texts, and counterarguments to other students' opinions. The aim was to establish active debates between the students. The teacher also took part in the discussions by presenting her own grounded points of view.

The discussions in the *e-mail groups* were, by contrast, textual and non-real time in nature. E-mail study was based on exchanging e-mail messages between the participants of each group. There was a distribution list attached to the e-mail program (Pine for Unix) which enabled many-to-many communication within the members of the groups. The e-mail studies lasted for 10 weeks, of which two weeks were set aside so as to give students the chance to write supplementary messages in cases where they had not written all the messages needed in time. The discussions held during each week were based on different texts and exercises. The students read the texts and did the exercises before taking part in the discussions. Students had to write at least three messages a week in order to pass the course. The messages were supposed to include both the students' own well-grounded arguments relating to the course material and critical comments directed towards other

students' positions. Both e-mail groups were directed by the same e-mail tutor. The tutor concentrated on directing the discussions so as to ensure that the students would present a number of well-grounded arguments, counterarguments, and refutations of other students' counterarguments. The aim of the study was to establish argumentative dialogues between the students, and to produce long counterargumentation chains. The tutor did not actively take part in the discussions, but instead let the students discuss subjects they found interesting by themselves.

Working methods

A free debate, role play, problem-solving discussion, and panel discussion were devices used in organizing the seminar discussions. The free debate and role play were based on individual working, while the problem-solving and panel discussions involved group working. In the face-to-face seminars all four working methods were used, while for the e-mail studies, only free debate and role play were involved. The reason for this was that e-mail studying was not thought to provide a suitable environment for group working (see Garton & Wellman 1995).

During the *free debate*, students presented their own grounded opinions on the questions encountered in the text material, as well as counterarguments to the claims encountered in the material and in other students' messages. The discussion topics were not defined beforehand. Thus, the students could freely emphasize those topics that they found interesting, contradictory, or important. In the *role play*, half of the students were given a point of view that they had to support in the discussions, and the other half were given an opposite point of view to support. In this way the discussion was restricted to topics in which there are two contradictory opinions. The viewpoint given to a student did not necessarily represent his/her own personal point of view on the issue in question. The aim of the *problem-solving discussion* was to reach a common understanding between the members of the group on the given problem. At first, students discussed the topic by putting forward their own viewpoints on the problem, and the reasons to support these. Subsequently the work was supposed to proceed through negotiations and collaborative working of the group members, aimed at reaching a common solution for the problem. The *panel discussion* was based on group working as well. In the subgroup working phase, students were divided into two subgroups, who were assigned opposing points of view on a "contradictory" topic. In this phase the members of both groups negotiated by themselves and created a common strategy designed to support the standpoint of their own group. In the panel discussion phase the groups encountered each other in a panel debate, in which the task of the students was to work as a group and defend their standpoint according to the strategy they had created in the previous phase.

Argumentation studies

The study of argumentation in the course involved a) lectures (2 x 2 hours), b) exercises in the course material (7 text packages), and c) 10 weeks of practical applications in face-to-face debates or in e-mail groups, using the different working methods. Of these three elements, the studying of argumentation in practice in the seminar groups played the biggest part. The purpose of both the lectures and the exercises was to support the seminar working. The purpose of the exercises was to introduce the students to the content and argumentative structure of the text material, and in this way to prepare them for the argumentative discussions in the seminar sessions. In the first two hours' lecture, at the

beginning of the first half of the course, the students were taught the main conceptual apparatus of the argumentation process which was to be utilized in the seminar discussions. In the second lecture, at the beginning of the second half of the course the students' knowledge of argumentation was deepened by teaching them the fundamentals of argumentation analysis. During the lecture the students analysed the e-mail discussions of the first half of the course by applying Toulmin's model (Toulmin, Rieke & Janik 1984) to analyse argumentative text. In this way the students were provided with more developed cognitive equipment for the seminar discussions during the second half of the course.

During their studies the students were taught that the process of argumentation consists of three phases: the presenting of one's own standpoints and supporting reasons (phase 1), the presenting of counterarguments against other peoples' standpoints (phase 2), and refutation of counterarguments (phase 3) when one defends oneself against criticism brought forward by other people. These three phases are recommended by Björk and Räisänen (1996) in their guide for academic writing and text analysis. The exercises the students did in the course material, in particular, supported the learning of the argumentation process phase by phase. The exercises relating to the first two text packages concerning the first theme (Sex roles ...) stressed the presenting of one's own arguments: the students were, first, asked to freely formulate their own positions with regard to some topic encountered in the texts, and second, to define and mark grounds in the texts that supported those positions. In the exercises relating to the text package concerning the second theme (Discipline problems ...) the students were asked to a) look for reasons why different things were defined as discipline problems in schools, b) define in the texts the means which might be used to solve the problems, and the rationale for using these means, and c) to compose their own counterarguments against the supposed effectiveness of these problem-solving means. Finally, in the exercises relating to the texts packages concerning the third (The compulsory ...) and fourth themes (Physical punishment ...) the whole argumentation process, starting from phase 1 and ending with phase 3, was rehearsed: the students were asked to define in the texts a) the grounds for a standpoint given to them, b) the counterarguments against that standpoint, and c) to compose their own refuting counterarguments against the counterarguments they had defined in the text.

Right from the beginning of the course, it was impressed on the students that the purpose of the seminar was to deploy and rehearse critical argumentation in practice. The students' task throughout the course, regardless of the working method used, was to put forward arguments for their positions and to criticize other student's opinions by presenting effective counterarguments (cf. van Eemeren & Grootendorst 1994). However, during the seminar discussions the emphasis on the rehearsing of different phases of the argumentation process varied according to the working method employed. In the discussions carried out during the first half of the course by means of free debate (face-to-face and e-mail groups) and problem-solving discussion (face-to-face groups) the emphasis was on the presenting of one's own arguments and counterarguments. During the second half the process of argumentation was completed. The purpose of the discussions which involved role play (face-to-face and e-mail groups) and panel discussions (face-to-face groups) was to bring about the kind of interaction in which the students a) put forward arguments for their positions, b) produced counterarguments against other students' positions, and c) defended themselves against criticism by refuting other students' counterarguments.

The structure of the argumentation studies during the course is shown in Table 2.

Table 2. Structure of the argumentation studies carried out during the course

Study group		
Face-to-face groups A and B		E-mail groups A and B
	1st half of the course (5 weeks)	
* LECTURE		* LECTURE
* EXERCISES * FREE DEBATE (Sex roles and equality in education)		* EXERCISES * FREE DEBATE (Sex roles and equality in education)
* EXERCISES * PROBLEM-SOLVING DISCUSSION (Discipline problems in school work: causes and proposed solutions)		* EXERCISES * FREE DEBATE (Discipline problems in school work: causes and proposed solutions)
	2nd half of the course (5 weeks)	
* LECTURE		* LECTURE
* EXERCISES * ROLE PLAY (The compulsory teaching of Swedish in school)		* EXERCISES * ROLE PLAY (The compulsory teaching of Swedish in school)
* EXERCISES * PANEL DISCUSSION (Physical punishment as a child rearing method)		* EXERCISES * ROLE PLAY (Physical punishment as a child rearing method)

The discussion themes were selected on the basis of the working method employed in the course. The discussions that took place during free debate and problem-solving sessions were designedly based on discussion topics that readily evoke different kinds of opinions and approaches to the issues. Sex roles, equality between different genders, and discipline problems in the schools were chosen as representing such many-dimensional themes. The working methods that were designed to sharply divide the opinions (role play and panel discussion) of the participants presupposed, by contrast, themes that were prone to polarize peoples' standpoints. The questions relating to the teaching of Swedish in Finnish schools as a compulsory subject (an actual controversial educational topic in Finland) and the acceptability of the physical punishment of children are both topics that divide people into two camps: those who are for and those who are against.

Data

The data of the study were collected before, during and after the course. In addition to the pretest and posttest measurements, the face-to-face discussions were video-recorded and the e-mail discussions stored by the computer. The students also evaluated the teaching they received during the course. The face-to-face students filled in a questionnaire after each seminar session, and the e-mail students filled in an e-mail questionnaire twice: in the middle of the course and at its end. The group interviews of the teachers and the exercises the students did in the text material were also included in the data.

The following results are based on preliminary analyses of the teachers' interview, the students' questionnaires, and the e-mail material. In the analyses of the interview and questionnaires, the students' and teachers' main experiences and perceptions of the different working methods were investigated. Furthermore, some of the students' e-mail messages were analysed utilizing the methods of analysis taught in the course.

Results

Free debate

The students from the face-to-face seminars found free debate to be a good working method, appropriate especially at the beginning of the seminar working. They characterized free debate as an interesting method that allows the free expression of thoughts when many kinds of opinions, even unusual ones, arise in the course of discussion. The face-to-face teachers characterized free debate as a good warming-up method for further discussion allowing the students time to familiarize themselves with the pedagogical idea - the studying of argumentation - which lay behind the course. Since Finnish students are not familiar with studies based primarily on discussions, it was important that at the beginning of the course the students were given freedom of expression in order to get them acquainted with the new study method. The disadvantages mentioned by the students were that free debate gives an advantage to talkative persons, which easily leads to an unequal distribution of talking time in the seminar. In addition, an aspect worth noticing is that both the students and teachers noted that criticism and counterargumentation occurred only rarely during free debate.

The opinions of the e-mail students were along the same lines as those of the face-to-face students. The e-mail students found free debate to be a good method that led to a smooth beginning to the discussions by allowing them to freely write their own opinions. However, the students found many of the e-mail messages to be too long, too kind to the other person, and rather unstructured, making them difficult to comment on. This led to uncritical discussions in which counterargumentation was rare. The e-mail teacher's observations were similar to the students: the students' messages included a lot of loose text and only a little counterargumentation.

In spite of the rarity of counterarguments and the straggling texts produced by free debate, the preliminary analyses of the e-mail messages indicated that the messages also included developed argumentation. The e-mail message shown in example 1 was sent during the course of the studies, and its argumentative structure is analysed using Toulmin's model. The analysis is identified in the text by symbols referring to the elements of Toulmin's model (C = Claim; G = Ground; W = Warrant; R = Rebuttal) and summarized in Table 3. An analysis of the message was also included in the teaching of argumentation during the second lecture in the middle of the course.

Example (1): An e-mail message sent during the course

Working method: Free debate
Sent by: A female student of education, aged 22, 110 study weeks[1]
Date sent: Wed, 11 Feb 1998, 09:13:52
Subject: Think about school, my friend (Theme 1: Sex roles and equality in education)

Frankly speaking I am annoyed at that school is so an unequal place (C)! Everywhere else people mouth in foam are nagging for equality, while at the same time poor children are neglected and left without attention. Even from my own school experiences I remember that there are more room for the boys than for the girls (G1). Girls tend to be left in the shadow of the boys (C) when all the attention is directed to the boys (G2) due to their disturbing behaviour or well doing. I totally agree with Tuula Vainikainen's comment that teachers find boys to be more interesting and challenging than girls (G3), and in this way girls are left automatically in the shadow. In addition, boys are allowed certain exemptions so that they are not so much pressed for the failures than girls (G4). Boys are not either forbidden as eagerly as girls (G5). At least in my childhood boys were allowed to rage during the lessons, but if girls made a noise they were at once pointed by a finger and said that "what is that whispering?" and that "please, behave yourself". There has been a lot of talk about the topic that since already at the elementary school girls are not rewarded for success or encouraged in the same way than boys are (G6), girls do not have, for example, possibilities to succeed in mathematics, even if they were good in it. Children are unconsciously made to understand that girls cannot succeed in mathematics, and that it is better to be successful in handwork and arts. If girls are not, already when they are small, directed and encouraged to do things they feel good, they may perhaps never become experts in mathematical occupations even if they had resources. Of course one has to remember that there are many kinds of students and teachers, and thus, generalizations should not be done (R), but on the basis of study results it can clearly be said that girls are defeated and left in the shadow of boys (C).

Table 3. The analysis of the e-mail message (example 1) by Toulmin's model

GROUNDS		CLAIM
1. Boys have more room in schools 2. Boys receive more attention 3. Teachers find boys to be more interesting 4. Boys are allowed exemptions 5. Boys are not so readily forbidden 6. Girls are not rewarded and encouraged in the same way as boys are	WARRANT Implicit generalization made on the basis of six different grounds	School is an unequal place, or girls are left in the shadow of the boys
		REBUTTAL One has to remember the differences between individuals: teachers do not necessarily favour all the boys

[1] In Finnish university studies, one "study week" is defined as corresponding to about 40 hours of work. During one year a full-time student usually completes approximately 40 study weeks.

The message represents a typical text sent during the studies: in order to open up further discussion the student has presented her own critical argument concerning a subject she has found interesting or controversial in the text material. In addition, the message also indicates that relevant argumentation took place during the course: the argumentation analysis of the text reveals six supporting grounds for the claim made and a rebuttal, as indicators of the high level of argumentation in the message. Finally, the claim is implicitly warranted by a generalization: six grounds for the claim justifies the generalization.

Problem-solving discussion

The discussions which took place following the problem-solving method in the face-to-face groups resembled the discussions during free debate, since the expression on ideas was based on students' personal opinions. The students' task during the first part of the discussions was to have a debate on the reasons underlying different kinds of discipline problems in schools, and during the second part the students were supposed to formulate a common solution for the problems. According to the students, the problem-solving discussion during the first half worked, in that there was a lot of debate and counterargumentation on the topic. However, the solutions for the discipline problems in schools that the students had hoped to find during the second part remained elusive. The teachers pointed out the same problem: the students were not able to formulate any common solution. Most of the students were not teachers themselves, and a general opinion among them was that the task of formulating a common solution was difficult and artificial.

Role play

The face-to-face students' prevalent opinion of role play as a study method was that it worked well: the students found that it was easier for them to commit themselves to the discussions when the standpoint they were to take was pre-determined for them, and they were not allowed to change it. The students also noted, first, that when one has the possibility to hide behind a role, one's arguments tend to be stronger than would otherwise be the case, and second, that role play also forced one to put forward one's points of view. Some of the students, however, found it difficult to argue the grounds for a given claim, especially in situations in which they did not have anything essential to say. The two-dimensional nature of the role play, to have to be either for or against some position, was also experienced as a problem by some of the students: usually it is possible to find a certain amount of support fort both of the opposed viewpoints, and to maintain the same stand all the time is not necessarily easy for everyone. In addition, the face-to-face teachers, and some of the students as well, noticed that during role play the personal opinion of some of the students began to change. In particular, the personal opinions of the students who defended a claim opposite to their own viewpoint at the beginning of the discussions gradually changed so as to resemble the one they defended in the role play. This result suggests that one of the objectives of the course was reached: to make the students aware of the fact that many educational issues can usually be viewed from many angles, each of which can be supported by good arguments.

The e-mail teacher's main observation was that during role play students' messages became more argumentative, and more student-student debates arose. The preliminary analysis of the e-mail discussions supports the teacher's view. The students' discussions

included many long counterargumentation chains, in which different debaters presented their opinions and criticized each others' positions by means of relevant counterarguments. Example 2 illustrates the e-mail discussions carried out during role play. The example is a combination of parts of four messages sent by two e-mail students (A and B). The students are engaged in a debate on the issue of whether the Swedish language should be compulsory in Finnish schools or not. Student A (A male student of education, aged 27, 140 study weeks) is against, and B (A male student of sociology, aged 26, 101 study weeks) for the compulsory study of Swedish.

Example (2): An argumentative dialogue between two e-mail students

A: Claim and grounds
I think that to be able to speak Swedish and to study it is unnecessary, but the problem is that studying is compulsory. Compulsion does not fit to the current view of the nature of learning, student-centred thinking and meaningful learning, motivation and understanding the student as a subject of the learning process.

B: Counterargument
Did you say that compulsion does not fit to the current view of the nature of learning. But have you noticed that the whole idea of the comprehensive school is compulsion. Nobody criticizes the compulsory mathematics or mother tongue.

A: Refutation of the counterargument
Is it reasonable to set languages at the same line with other subjects? Is the studying of mathematics similar, for example, to the studying of Swedish? I think that it is not. The target of language teaching is, in particular, the diversified use of the language in question: to talk, to write and to read. The matter concerned in the studying of mathematics is, rather, the learning of a certain way to think, the ability to set, for example, a problem, to form an equation, and to solve it.

B: Refutation of the counterargument
Of course subjects differ from each other in terms of the content and to study them is different. However, the studying of Swedish can be placed at the same line with the studying of mathematics in the sense that both are compulsory subjects in Finnish elementary school. Both of the subjects are experienced as important in Finland in general, since there must be some reason for that they had become compulsory.

The progress of the argumentation process in example 2 is mainly in accordance with the phases of the argumentation process taught to the students in the lecture which preceded the task. The dialogue starts from the grounded claim made by student A followed by a critical comment from student B. After this both students aim at refuting each other's counterarguments by presenting grounds for their own standpoint.

Panel discussion
Like the role play, the panel discussion too got positive feedback from both the students and the teachers. The participants found it a positive thing that in the panel discussion the essential elements of the argumentation process were combined: the advancement of one's own grounded opinions, and the anticipation of possible counterarguments during the subgroup working phase, and refutation of the counterarguments of the opposite side during the panel discussion phase. In addition, the students stated that the panel discussion

method taught them to anticipate and think about the possible attacking strategies the opposite side might use in the panel debate. The teachers' main point concerning the panel discussion was that the students really seemed to work as a group: during the subgroup working phase a common defence strategy was created and during the panel discussion phase the groups followed that strategy. The most critical issue for the students was related to the discussion topic, Physical punishment as a child-rearing method. Many of the students whose task was to defend the acceptability of physical punishment felt anxiety when they had to put forward arguments for a position which conflicted with their personal moral values. For this reason, in the second discussion session on physical punishment the students were, contrary to the original plans, allowed to discuss the topic freely without being obliged to play pre-determined roles.

Discussion

The preliminary results concerning the different study methods revealed that it was when students were given a certain position to defend, that most counterargumentation was provoked in discussions: the conflicting positions aroused critical discussion and debate between the students. Playing specific roles also structured and directed discussions in the desired direction. Free debate, on the other hand, turned out to work best at the beginning of the study course, as a means to get students acquainted both with the study method and the discussion group, and to remove initial tension before the discussions got properly started.

Preliminary analyses of the discussions in face-to-face and e-mail environments indicated that the e-mail discussions were the more structured, and included more argumentative opinions and counterargumentation between the students. The discussions that took place during role play, in particular, turned out to include several heated debates and counterargumentative episodes between the students. The first impression of the face-to-face discussions, by contrast, was that they were much more incoherent: they included a lot of different opinions, short responses to these, and arguments whose rationale was somewhat doubtful. Furthermore, the interviews with the teachers revealed that in an e-mail environment it was easier for the teacher to give feedback to the students: the e-mail teacher has more time to analyse the level of argumentation in the messages and to give the students personal advice on how to improve their argumentation. In a face-to-face environment, by contrast, the tempo of the discussions is high, and the teacher has only limited opportunities to provide students with considered feedback and advice. However, the face-to-face teacher's feedback is immediate, whereas in an e-mail environment the problem often is that the teacher's feedback comes too late.

It is important to note that e-mail discussions, unlike face-face-to discussions, do not develop oral argumentation skills. The ability to present well-grounded arguments orally is an important cognitive adjunct in many kinds of negotiations, for example, in scientific meetings and business life. Thus, learning environments based on both face-to-face and written communication are needed when practising argumentation skills. One suggestion the teachers of the current course made was that perhaps the most appropriate environment for the studying of argumentation skills would be one in which the favourable features of both environments were combined: time to think over and consider the written arguments in an e-mail environment, and the chance to exercise ready wit and negotiation skills in a face-to-face environment. One possible way of putting this idea into practice might be, for

example, a panel discussion including some written final work or short thesis. In the subgroup working phase, the discussion is equal and collaborative, aiming at a common defence strategy for the group. In the subgroup phase the students also have time to consider their own arguments and anticipate the opposite side's counterarguments. As a final task of the subgroup work, both groups could practise written argumentation by producing a paper or a thesis. The paper could consist of a summary of students' arguments for the position of their own group, and counterarguments against anticipated attacks by the other side. Finally, at the panel discussion phase the students would practise their skills in putting forward arguments orally, and practise reacting to criticism with a ready tongue.

In further analyses of the data the following questions, in particular, will be explored: a) was there any development in the students' argumentation skills by different working methods in face-to-face and e-mail environments? b) what are the characteristics of the argumentation produced by different working methods in face-to-face and e-mail environments? and c) what things are relevant in terms of the teaching of argumentation, especially in the methods of the teacher, in the course material, and in the exercises.

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For more information, please contact:

Miika Marttunen, Ph.D.
University of Jyväskylä
Department of Education
P.O.Box 35
40351 Jyväskylä, Finland
Phone: + 358 14 601842
Fax: + 358 14 601661
E-mail: mmarttun@campus.jyu.fi